

# **Energy Efficiency of Various Hydraulic Drives used in Injection Moulding Machines**

**Dr.-Ing. Reinhard Schiffers**

KraussMaffei Technologies GmbH, Krauss-Maffei-Str. 2, 80997 Munich,  
E-mail: Reinhard.Schiffers@KraussMaffei.com

**Dipl.-Ing. MBA Georg P. Holzinger**

KraussMaffei Technologies GmbH, Krauss-Maffei-Str. 2, 80997 Munich,  
E-mail: Georg.Holzinger@KraussMaffei.com

## **Abstract**

The presentation starts with an introduction of the injection moulding process. The basic process steps of the injection moulding cycle as well as the relevant machine functions are illustrated.

Besides the performance and productivity of injection moulding machines in recent years the subject of "energy efficiency" has moved more and more into focus and can be demonstrated by an increased demand in the plastics processing industry. Driven by the need of an improved systems efficiency several new developments have been introduced in the hydraulic drives technology of injection moulding machines. One approach for example is the use of frequency converter controlled variable speed servomotors as main drives for injection moulding machines. Compared to the current standard drive, the mains-powered asynchronous motor with variable displacement pump, they have very low power losses at low flow rates or in idling phases. Depending on the mould that is installed and the corresponding process settings, the savings in terms of energy can be as high as 50% of the total energy required. The presentation will offer an overview on the different drives that are used in injection moulding machines and will give a classification by means of energy efficiency in different fields of application.

Since the hydraulically driven injection moulding machines have to compete with electromechanically driven ones at the market, these are also taken into account.

**KEYWORDS:** injection moulding machines, energy, comparison, drives technology